

Sub 1037  
C1  
(13) concomitantly with each opening of the same; and], said conveying template including [means of retention suitable for engaging each thermoformed article] a receiving hole for each thermoformed article to be extracted, each receiving hole being defined along its depth by two annular surfaces reamed in opposite directions and defining between them an equatorial shoulder for engaging and positioning each thermoformed article.

Sub E3  
C2  
3. (Twice Amended) A thermoforming apparatus as claimed in Claim 1, further comprising a carousel conveyor [(20)] with a plurality of bearing arms and associated conveying templates, each conveying template being [of which supports a respective head (17)] fitted with said [retention means] equatorial shoulder for the retention of the thermoformed articles [(15)] in correct orientation while they are being conveyed, stepwise and synchronously with the opening-closing rate of the dies, through at least one work and/or treatment station positioned around the carousel conveyor.

4. (Twice Amended) An apparatus as claimed in Claim [3] 1, wherein the thermoformed articles have rims and [wherein the said retention means for each extraction head (17) comprises a hole through the extraction head for each thermoformed article to be extracted, each hole being machined along its thickness to obtain two annular surfaces reamed in opposite directions and delimiting between them an] wherein the equatorial shoulder [(16d) with] includes a slightly undercut, internal angle of incidence, in order to allow insertion by the thrust of a rimmed thermoformed article [(15)] and enable it [t] to be resiliently constrained and held firmly in position at its rim.

Sub 1037  
(Twice Amended) A thermoforming apparatus as claimed in Claim 1, further comprising:  
a chain conveyor [(24)] wound by a pair of chain wheels and having a run

Sub 13/7  
C 8  
[(27)] thereof extending along the respective die [(12)] or counter-die [(13)] but beyond the encumbrance thereof; and

a plurality of extraction plates [(16)] carried at predetermined intervals from each other on said conveyor, [(24) and] each extraction plate being fitted with said [retention means] receiving holes with equatorial shoulders for retaining the thermoformed articles [(15)] in [the] proper [set] orientation during their conveyance.

Sub 14/7  
C 3  
6. (Three Times Amended) A thermoforming apparatus as claimed in Claim 1 [5], further comprising a template conveyor [(24)] extending through [the] at least one work and/or treatment station and moving stepwise at the opening-closure rate of the dies [(12)] for receiving a thermoformed articles [(15)] from an extraction plate [(16)] associated with said extraction means and conveying them in sequence to [the] at least one work and/or treatment station along the template conveyor [(24)].

Sub 15/7  
C 4  
7. (Twice Amended) A thermoforming apparatus as claimed in Claim 6, wherein said template conveyor [(24)] comprises two alternately movable templates [(17)], so that [a] one of said templates [(17)] is moved laterally, in relation to the female die, [(12)] at [a] at least one work and/or treatment station, while the other [one] template is in front of it to receive [an] a thermoformed article [moulding] from the extraction plate [(16)].

8. (Twice Amended) A thermoforming apparatus as claimed in Claim 6, wherein said template conveyor [(24)] is a chain conveyor which comprises a pair of chain wheels [(26)] around which a respective chain [(25)] is wound, a plurality of templates [(17)] carried, spaced at a predetermined distance from each other, on [the] said chain conveyor [(24)] and each fitted with said [retention means for] equatorial shoulders retaining the thermoformed articles [(15)] in [the] proper

*Sub 105* ~~[set] orientation during their conveyance.~~

9. (Twice Amended) A thermoforming apparatus as claimed in Claim 6, wherein said template conveyor [(24)] comprises a train of articulated bearing slides [(32)] or carriages [(33)] for a respective template [(17)] moving through [the] at least one work and/or treatment station.

*Sub E4* 10. (Three Times Amended) A thermoforming apparatus as claimed Claim [6] 1, [wherein said retention means on each template comprises] further including a truncated conical collar [(38)] seated in each receiving hole for precise location of a respective thermoformed article [(15)] on [the] a surface of [each] the conveying template [(17)] facing the extraction plate of plates (16)].

*C4 Sub 106* 11. (Twice Amended) A thermoforming apparatus as claimed in Claim 10, wherein said collar [(38)] is constituted of resiliently deformable material suitable for exercising [a moderate] retentive pressure on the external surface of a thermoformed article [(15)].

12. (Twice Amended) A thermoforming apparatus as claimed in Claim 10, wherein said collar [(38)] comprises a plurality of resiliently loaded ratchets [(48)], installed in said collar and movable towards its internal diameter for engaging with the external surface of a thermoformed article [(15)] in a respective receiving seat.

*Sub 19* 13. (Twice Amended) A thermoforming apparatus as claimed in Claim 10, wherein said collar [(38)] comprises suction orifices which exert on the thermoformed article [(15)] a suction action to hold it in [the] proper [set] orientation in its respective receiving [seat] hole and with its rim abutting against the template [(17)].

Sub D77 14. (Twice Amended) A thermoforming apparatus as claimed in Claim 10, wherein the thermoformed articles have rims and wherein each template [(17) at each flanged receiving set for thermoformed rimmed articles (15)] has a peripheral recess formed on the surface of the template about a receiving hole [(17) facing the extraction plate or plates (16)] for engaging the rim of a [respective] thermoformed article [(15) installed] received in [it] the receiving hole.

C4 15. (Three Times Amended) A thermoforming apparatus as claimed in Claim 6, wherein the thermoformed articles have rims and [wherein said retention means for each template (17) comprises] further including a two-diameter adaptor collar [(39)] installable in [each] a receiving seat and having an internal diameter delimited by a tapered under section, and undercut intermediate section [with a negative angle alpha], an annular shoulder downstream of the undercut section, [to be able to receive from above] for receiving a [flanged] thermoformed article [(15)] and snap-engage its rim at [is] said undercut.

16. (Twice Amended) A thermoforming apparatus as claimed in Claim 6, wherein the thermoformed articles have rims and wherein said [retention means for each template (17) comprises] receiving holes [for the thermoformed articles lower portion, but with] have a slightly smaller internal [diameter] dimension than the external dimension[s] of the thermoformed articles adjacent their rims [(15) to be received [close to its rim], so that the thermoformed article [(15)] is resiliently constrained and [then steadily bedded] and properly oriented in the respective receiving hole.

17. (Twice Amended) A thermoforming apparatus as claimed in Claim 6, [wherein said retention means of each template (17) comprises] further including eccentric mechanical arrests [(50)], each of which is fitted at a respective receiving hole of a template [(17)] and is movable between an operating position in which it

Sub 107 engages the rim of a flanged thermoformed article [(15)] and an inoperative releasing position.

Sub 113 18. (Twice Amended) A thermoforming apparatus as claimed in Claim 17, wherein said arrests are controlled by a rack operated by a [suitable] motion source.

C4 Sub 108 19. (Three Times Amended) A thermoforming apparatus as claimed in Claim 6, [wherein said retention means comprises] further including air jets [(53)] for sinking each of the articles [(15)] into the receiving holes [on each template (17)].

20. (Three Times Amended) A thermoforming apparatus as claimed in Claim 6, [wherein said retention means comprises] further including a cup-shaped receiving component [(54, 61) by acting through] for a thermoformed article, the cup-shaped component being disposed adjacent at least one of said receiving holes and having at least one orifice [(55)] in [the] a bottom of the cup-shaped component.

21. (Twice Amended) A thermoforming apparatus as claimed in Claim 20, further comprising a push rod [(56)] for expelling the thermoformed article [(15)] from the cup-shaped component [(54, 61)] by acting through at least one orifice [(55)] in the bottom of the cup-shaped component.

22. (Three Times Amended) A thermoforming apparatus as claimed in [any one of] Claim [6] 1, wherein the thermoformed articles have rims and wherein said [retention means comprises] receiving hole has a support shoulder for shallow, thermoformed articles arranged between each receiving [seat of the template (17)], said shoulder including an annular projection which engages the internal diameter of the rim of the article.

Sub 108 23. (Three Times Amended) A thermoforming apparatus as claimed in Claim 6, wherein said template conveyor includes a plurality of templates and wherein said retention means comprises a push-rod which rises from a surface of each template [(17)].

C4 24. (Three Times Amended) A thermoforming apparatus as claimed in Claim 6, wherein the thermoformed articles have rims and wherein said [retention means compris] receiving hole includes at least one annular recess[, in which the free] for receiving the rim of [an upturned hollow] one of said thermoformed articles, [(15) abuts] the rim thereof, when received in said annular recess, abutting a movable push rod [(56)] provided for removal of the article [(15)].

[Please add the following new claims:]

Sub 109 25. (New) A thermoforming apparatus comprising at least one female die and counter-die reciprocally approachable and moveable for the operations of closing, thermoforming and opening, a feeder apparatus adapted for feeding thermoforming material between each female die and counter-die, and an extraction pick-up apparatus adapted to withdraw at least one thermoformed article from the female die and to transfer said at least one thermoformed article to a receiving conveying template, at least one of the extraction pick-up apparatus and the receiving conveying template including a retention surface adapted to engage each thermoformed article, at least one retention surface being defined by at least a portion of a wall of a cavity in an element associated with at least one of the extraction pick-up apparatus and the receiving conveying apparatus, the cavity communicating with at least one exterior surface of the element and having an interior dimension which is smallest in a region remote from said exterior surface to define a shoulder thereat for resiliently holding a thermoformed article disposed in the cavity.

Sub 17  
26. (New) The thermoforming apparatus of claim 25 wherein the element is a plate and has two exterior surfaces are disposed essentially parallel to each other, the cavity communicating with both exterior surfaces.

Sub 17  
27. (New) The thermoforming apparatus of claim 25 wherein the wall of the cavity is defined by two annular inclined surfaces which intersect each other at said shoulder

Sub 17  
28. (New) The thermoforming apparatus of claim 26 wherein the two annular surfaces intersect each at plane which is disposed perpendicular to an axis of the cavity.

CS  
29. (New) The thermoforming apparatus of claim 28 wherein the thermoformed article has a rim and wherein the shoulder is defined where the two annular surfaces intersect each other, the shoulder having a slightly undercut, internal angle of incidence, in order to allow insertion by the thrust of a rimmed thermoformed article and to enable the rimmed thermoformed article to be resiliently constrained and held firmly in position at its rim.

Sub 17  
30. (New) The thermoforming apparatus of claim 25 wherein the thermoformed article has a rim and wherein the shoulder has a slightly undercut, internal angle of incidence, in order to allow insertion by the thrust of a rimmed thermoformed article and to enable the rimmed thermoformed article to be resiliently constrained and held firmly in position at its rim.

~~31. (New) A thermoforming apparatus comprising at least one female die and counter-die reciprocally approachable and moveable for the operations of closing, thermoforming and opening, a feeder apparatus adapted for feeding thermoforming~~

material between each female die and counter-die, and an extraction pick-up apparatus adapted to withdraw at least one thermoformed article from the female die, the extraction pick-up apparatus having at least one retention surface adapted to engage said at least one thermoformed article, said at least one retention surface being defined by at least a portion of a wall of a cavity in an element associated with said extraction pick-up apparatus, the cavity communicating with at least one exterior surface of the element and having a cavity inner dimension immediately adjacent said exterior surface which is greater than a cavity inner dimension in a region spaced from said exterior surface thereby defining a shoulder at said spaced region for resiliently holding a thermoformed article disposed in the cavity.

32. (New) The thermoforming apparatus of claim 31 wherein the element is a plate having two exterior surfaces which are disposed parallel to each other, the cavity communicating with the two exterior surfaces.

33. (New) The thermoforming apparatus of claim 31 wherein the wall of the cavity is defined by two annular inclined surfaces which intersect each other at the shoulder.

34. (New) The thermoforming apparatus of claim 33 wherein the two annular inclined surfaces intersect each at plane which is disposed perpendicular to an axis of the cavity.

35. (New) The thermoforming apparatus of claim 34 wherein the thermoformed article has a rim and wherein the shoulder has a slightly undercut, internal angle of incidence, in order to allow insertion by the thrust of a rimmed thermoformed article and to enable the rimmed thermoformed article to be resiliently constrained and held firmly in position at its rim.



Sub D7 36. (New) The thermoforming apparatus of claim 31 wherein the thermoformed article has a rim and wherein the retention surface is defined by the shoulder on the wall of cavity, the shoulder having a slightly undercut, internal angle of incidence, in order to allow insertion by the thrust of a rimmed thermoformed article and to enable the rimmed thermoformed article to be resiliently constrained and held firmly in position at its rim.

35 37. (New) A thermoforming apparatus comprising at least one female die and counter-die reciprocally approachable and moveable for the operations of closing, thermoforming and opening, a feeder apparatus adapted for feeding thermoforming material between each female die and counter-die, and an extraction pick-up apparatus adapted to withdraw at least one thermoformed article from the female die, the extraction pick-up apparatus having at least one surface adapted to resiliently hold said at least one thermoformed article, said at least one surface being defined by at least a portion of a wall of a hole in a plate associated with said extraction pick-up apparatus, the hole in the plate having an inner dimension immediately adjacent one exterior surface of the plate which is greater than an inner dimension of the hole in an interior region spaced from exterior surfaces of the plate thereby defining a shoulder in said interior spaced region for resiliently holding a thermoformed article disposed in the hole in the plate.

Sub P13 38. (New) The thermoforming apparatus of claim 37 wherein the wall of the hole in the plate is defined by two annular inclined surfaces which intersect each other at the shoulder.

39. (New) The thermoforming apparatus of claim 38 wherein the two annular inclined surfaces intersect each at plane which is disposed perpendicular to an axis of the hole in the plate.

40. (New) The thermoforming apparatus of claim 37 wherein the thermoformed article has a rim and wherein the shoulder has a slightly undercut, internal angle of incidence, in order to allow insertion by the thrust of a rimmed thermoformed article and to enable the rimmed thermoformed article to be resiliently constrained and held firmly in position at its rim.

C5  
41. (New) The thermoforming apparatus of claim 37 wherein the thermoformed article has a rim and wherein the hole in the plate has a peripheral recess formed on said one exterior surface of the plate for engaging the rim of a thermoformed article received in the receiving hole in the plate.

Sub 14  
42. (New) A thermoforming apparatus as claimed in Claim 1, wherein said pick-up extraction means comprises a plate-like head arranged to be sequentially inserted between the or each female die and counter-die concomitantly with each opening of the same.

---

IN THE ABSTRACT:

Please cancel the abstract added by the last amendment and substitute therefor the following abstract:

---

C6  
--A thermoforming apparatus having a female die and a counter-die reciprocally approachable and moveable for the operations of closing, thermoforming and opening, a feeder apparatus adapted for feeding thermoforming material between the female die and the counter-die, and an extraction pick-up apparatus adapted to withdraw a thermoformed article from the female die. The extraction pick-up apparatus has a surface adapted to resiliently hold the thermoformed article, the surface being defined by a wall of a cavity in an element associated with the extraction pick-up apparatus, the cavity communicating with at least one exterior